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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,688	03/29/2001	Eiji Natori	109120	3149

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EXAMINER

HOGANS, DAVID L

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 04/10/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/819,688

Applicant(s)

NATORI, EIJI

Examiner

David L. Hogans

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 11 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 18-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-17, drawn to a method for manufacturing ceramics, classified in class 438, subclass 3.
 - II. Claims 18-33, drawn to a device for manufacturing ceramics, classified in class 257, subclass 295.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can also be used to deposit metallic films or semi-conductive layers, instead of ceramic films.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Art Unit: 2813

5. During a telephone conversation with Thomas Pardini on March 25, 2002 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-17. Affirmation of this election must be made by applicant in replying to this Office action. Claims 18-33 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1, 2, 5 and 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by 6,232,167 to Satoh et al.

In reference to Claims 1, 2, 5 and 15-17, Satoh et al. teaches:

Claim 1

- a ceramic material formed on a substrate by heating and vaporizing Bismuth raw material and mixing it with Argon and Oxygen gas for deposition on a substrate
(See column 7 lines 14-26 and column 8 lines 35-60)

Art Unit: 2813

Claim2

- a diameter of fine raw material that is 50 nm (See column 9 lines 1-5)

Claim 5

- a fine particle raw material that is gasified before mixing with the reaction gas
(See column 7 lines 16-20 and column 8 lines 35-60)

Claim 15

- the ceramic film is a dielectric (See Figure 1 and column 11 lines 35-47)

Claims 16 and 17

- a dielectric formed at 400 °C (See column 8 lines 57-59 and column 9 lines 53-61)

3. Claims 1, 4 and 6-11 are rejected under 35 U.S.C. 102(e) as being anticipated by 6,060,391 to Tatsumi.

Claim1

- a ceramic organic metal gas material (raw material) formed on a substrate after mixing with a plasma(active species)/inert gas mixture (See column 2 lines 21-38)

Claim 4

- a fine particle that is electrically charged (See column 4 lines 48-53)

Claim 6

- the active species (plasma gas) is a radical or ion (See column 5 lines 3-5)

Claim 7

Art Unit: 2813

- the active species (plasma gas) is a ion of the raw material species (ceramic organic metal gas) (See column 2 lines 25-32; the raw material ionizes in the presence of the active/plasma gas and becomes one and the same)

Claim 8

- the active species is an ion of oxygen (See column 4 lines 63-65; oxygen mixes with the plasma in the growth chamber and becomes ionized consequently)

Claims 9 and 10

- the active species is an ion of inert gas (Argon) (See column 5 lines 5-7)

Claim 11

- the active species is fed to the substrate in a accelerated state (See column 2 lines 25-32; all components are ionized from interaction with the plasma gas and hence in an accelerated state)

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over 6,232,167 to Satoh et al. in view of 6,146,905 to Chivukula et al.

Claim 3

Incorporating all arguments of Claim 1 above and noting that Satoh et al. fails to explicitly teach a diameter of fine particle that is 0.01 micrometer or less.

However, Chivukula et al., in column 6 lines 37-40, teaches a particle diameter of 10 nm. Further, Chivukula et al. discloses that a superior high frequency response is noted in integrated circuits that are formed from reproducible small grain size ferroelectric layers.

It would have been obvious to one of ordinary skill in the art to modify Satoh's et al. teachings in view of Chivukula's et al. teachings of a particle diameter of 10 nm. Satoh's et al. modification via Chivukula's teachings is obvious because reproducible small grain size ferroelectric layers produce a superior high frequency response.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over 6,232,167 to Satoh et al in view of 5,563,762 to Leung et al.

Incorporating all arguments of Claim 1 and noting that Satoh et al. fails to explicitly teach a ceramic film formed on part of a substrate.

However, Leung et al., in Figure 3 and column 8 lines 25-30, teaches a ferroelectric dielectric material that is selectively deposited on a bottom electrode.

Further, Leung et al. teaches the selective deposition so that an isolated capacitor structure may be made.

It would have been obvious to one of ordinary skill in the art to modify Satoh's et al. teachings in view of Leung's et al. teachings of a selectively deposited ferroelectric layer. Satoh's et al. modification via Leung's et al. teachings is obvious because the selective deposition creates desired structures. Furthermore, Leung's et al. functional use of selective deposition of ferroelectric material renders its application obvious.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over 6,232,167 to Satoh et al. in view of 5,563,762 to Leung et al. further in view of 5,932,904 to Hsu et al and further in view of 6,207,236 to Araki et al.

Incorporating all arguments of Claim 1 and noting that Satoh et al. fails to explicitly teach a film-forming region on a substrate having an affinity for ceramics with a non-film-forming region having no affinity for ceramics.

However, Leung et al., in Figure 3 and column 8 lines 25-30, teaches a ferroelectric dielectric material that is selectively deposited on a bottom electrode. Further, Hsu et al., in column 4 lines 20-25, teaches that Iridium or Iridium Oxide is a suitable conductive material to deposit a ferroelectric layer upon. Furthermore, Araki et al., in column 4 lines 11-33, teaches that fluorine containing compounds have excellent

non-sticking property when used as a coating compound. Such functional use of Iridium or Iridium Oxide as a suitable conductive material, such selective deposition as taught by Leung et al., and such non-sticking properties of Fluorine containing material as taught by Araki et al., renders these applications obvious to Satoh et al.

It would have been obvious to one of ordinary skill in the art to modify Satoh's et al. teachings, in view of Leung's et al. teachings, further in view of Hsu's et al. teachings and further in view of Araki et al. teachings of selective deposition of a ferroelectric material upon Iridium or Iridium Oxide and not upon a Fluorine containing compound. Satoh's et al. modification via Leung's teachings, Hsu's et al. teachings and Araki's et al. teachings is obvious because such functional use of Iridium or Iridium Oxide as a suitable conductive material, such selective deposition as taught by Leung et al. and such non-sticking properties of Fluorine containing material as taught by Araki et al., renders these applications obvious to Satoh et al.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over 6,232,167 to Satoh et al. in view of 5,456,945 to McMillan et al.

Incorporating all arguments of Claim 1 and noting that Satoh et al. fails to explicitly teach a misted chemical vapor deposition (CVD) process.

Art Unit: 2813

However, McMillan et al, in column 4 lines 55-60 and column 8 lines 10-25, teaches a ferroelectric layer that is deposited by a misted CVD process. Further, McMillan teaches that complex thin films (@ 200 Å), such as ferroelectric films, can be readily achieved by the misted CVD process. (See column 7 lines 50-55)

It would have been obvious to one of ordinary skill in the art to modify Satoh's et al. teachings in view of McMillan's et al. teachings of a ferroelectric film deposited by a misted CVD process. Satoh's et al. modification via McMillan's et al. teachings is obvious because thin ferroelectric films (@ 200 Å) can be readily achieved by the misted CVD process. Therefore, McMillan's et al. functional use of a misted ferroelectric CVD process renders its application obvious to Satoh et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Hogans whose telephone number is (703) 305-3361. The examiner can normally be reached on M-F (7:30-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Application/Control Number: 09/819,688

Page 10

Art Unit: 2813

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.



Doug Wille
Patent Examiner

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April 5, 2002